ALTAIR

Emissivity map manual

1. Object

This document describes the procedure to apply the emissivity map plug-in with Altair Software

2. Plug-in

In the standard installation software of Altair, this plug-in is not installed. To use it, you must re-install the Altair software and choose the custom mode.

3. Principle

This plug-in allows to compute a map of emissivity (Emissivity of each pixel) and to apply it on an live image or replay file.

To compute the emissivity, the plug-in needs 2 images at two different temperatures. These temperatures must be different of the ambient temperature (at least 20℃ more than the ambient temperature). End the difference between the temperatures should also at least 20℃.

Put your target inside an oven (or a climatic chamber), very close to the front door of the oven. The purpose is to have an uniform temperature over the target surface.

Fix the camera in front of this door to have the target in the field of view in order to save thermal images of the target.

Take care to have enough space to open the door of the oven.

The field of view must be locked and the target must keep the same place in the image of the camera during all the experiment.

The method consists on saving two thermal images for 2 different temperatures.

The recording should be fast enough to be sure that the target is not cooling down (same temperature as the oven). So it is better to save a short film which starts before to open the door and stops when door is fully opened.

By software one can extract the first image when the door is just fully opened.

Do the same for the two temperatures.

In electronics the test could be performed with a thermal shock support.

4. Creation of the map step by step

Switch on the oven, and heat the target at 40℃

Wait enough time to be sure that the target is at 40℃. One hour for example.

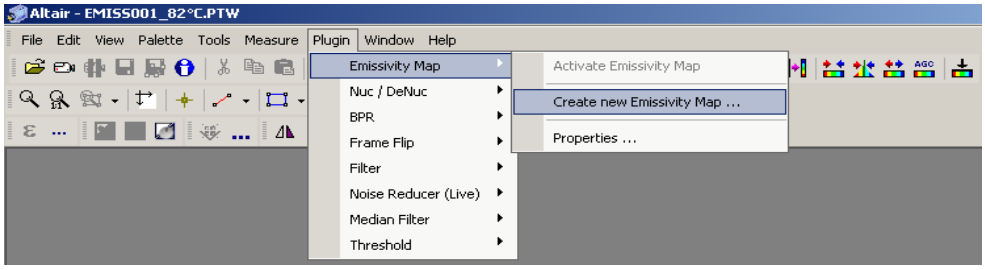
Open the door and record image as described above with Altair software in order to get the first image for one temperature

Close the door of the oven and heat the target at 80℃.

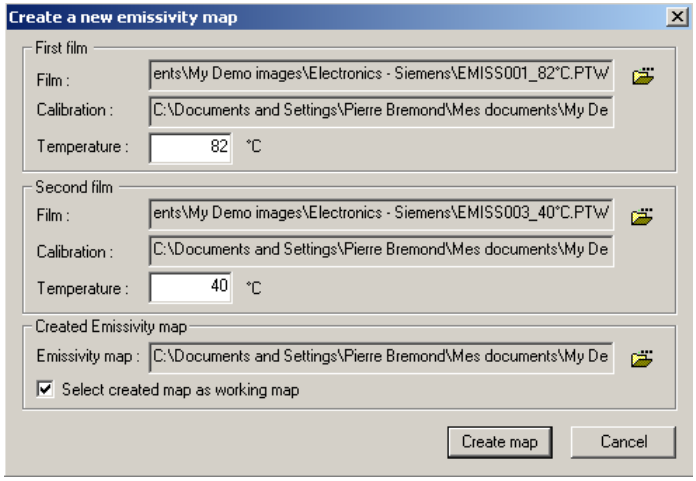
Wait enough time to be sure that the target is at 80℃. One hour for example.

Open the door and record the second image with the procedure described above. Now you have the second image for the second temperature.

Select Create new Emissivity map in Plugins of Altair



Select thermal image files made for 40℃ and 80℃



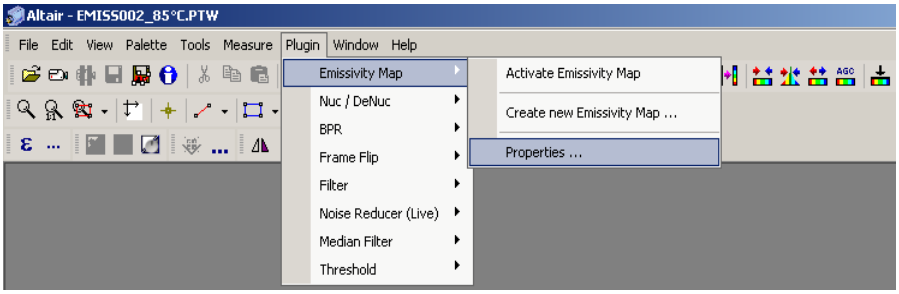
Give a name of the result file (map of emissivity) and launch the process to compute the emissivity map by the button “Create map”

Remark: the target mustn’t heat by itself. It must have the same temperature than inside the oven

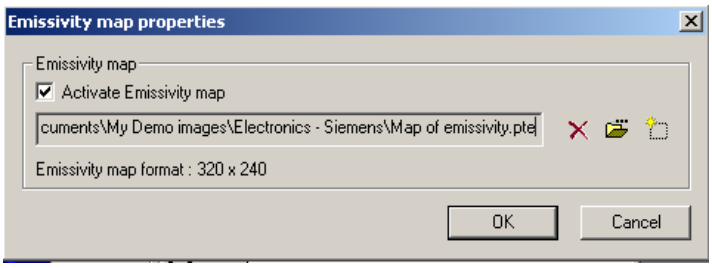
5. How to use the emissivity map

Select the image of the file or the live image

Select Emissivity map in Plugins menu

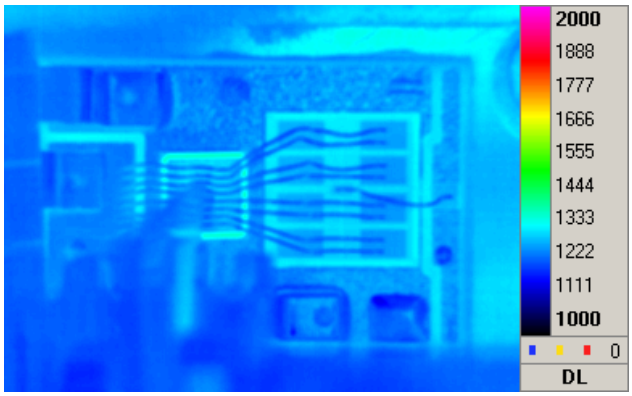


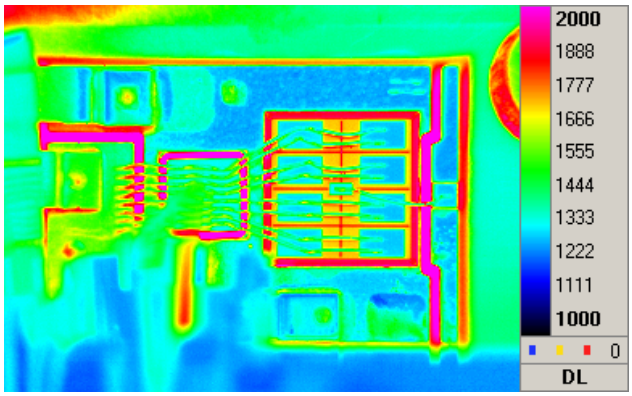
Select the map of emissivity file and select activate. The map is applied to the current thermal image



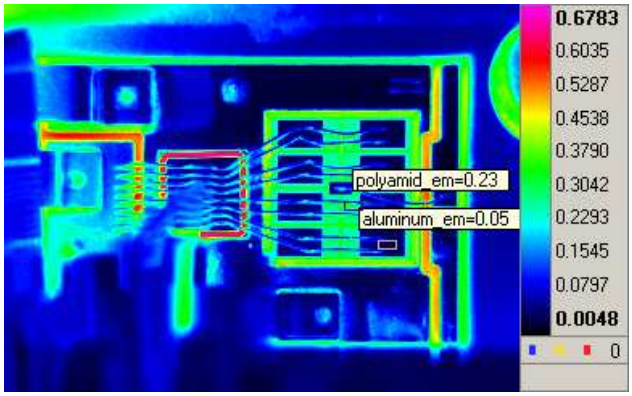
6. Example of emissivity equalization on electronic component

Images of homogeneous temperature (40℃ and 82℃)

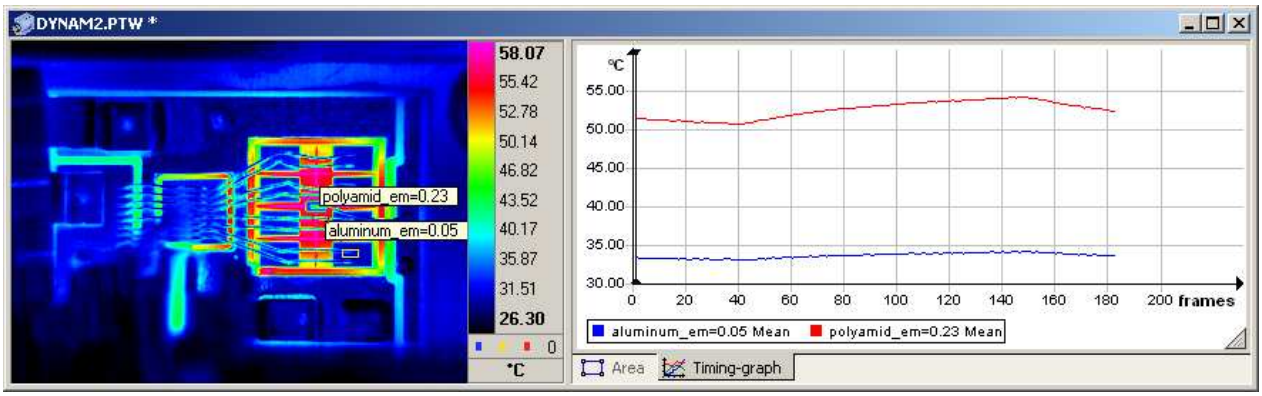




Map of emmissivity



Thermal image before emissivity correction



Thermal image after emissivity correction